

### REMARKS

Claims 12-28 are pending in the present Application. Claims 12 and 18 have been amended to further clarify the claimed invention. Support for these amendments can be found in the Specification at Para. [0025], [0026], [0062]-[0063], [0072]-[0076]. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and following remarks..

#### Claim Rejections Under 35 U.S.C. §§ 102(b) and 103(a)

Claims 12, 16, 17, 27 and 28 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Farkash et al. (US 2001/0036568) as evidenced by Houlberg (US 2004/0137295).

Claim 13 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of Kaneko (JP 06-318736).

Claim 14 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of U.S. Patent Application No. 2003/0003339 to Keegan.

Claim 15 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of U.S. Patent Application No. 2004/0137295 to Houlberg.

Claim 18,19, 21 and 24-26 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of U.S. Patent Application No. 2004/0101728 to Enjoji et al. (Enjoji).

Claim 20 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of U.S. Patent Application No. 2004/0101728 to Enjoji et al. (Enjoji) as applied to Claim 18 above, and further in view of Kaneko (JP 06-318736).

Claim 22 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of U.S. Patent Application No. 2004/0101728 to Enjoji et al. (Enjoji) as applied to Claim 18 above, and further

in view of Keegan (US 2003/0003339).

Claim 23 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application No. 2001/0036568 to Farkash et al. (Farkash) in view of U.S. Patent Application No. 2004/0101728 to Enjoji et al. (Enjoji) as applied to Claim 18 above, and further in view of Houlberg (US 2004/0137295). Applicant respectfully traverses these rejections.

Regarding independent claims 12 and 18, the Office Action maintains its assertion, on Pages 3-4 and 6-7, that the Farkash reference discloses a method of controlling a temperature of a fuel cell comprising measuring the operating temperature of a fuel cell assembly adjacent to a thermoelectric layer(s); and in response to the detected temperature, adjusting a power source to provide power to a resistive temperature device "254" to maintain plate "208" at a predetermined temperature. In applying Farkash, the Office Action on page 3 alleges that it is inherent that controlling a power source to provide power to a resistive temperature device comprises adjusting a voltage of a power source to the resistive temperature device to heat or cool the fuel cell assembly in contact with the thermoelectric layer. In other words, the Office Action asserts that increasing a voltage applied to the resistive temperature device in Farkash actively heats the end cell, while decreasing or turning off the voltage of the resistive temperature device passively cools the end wall, and that this reads on claims 12 and 18.

While the Applicant again respectfully disagrees with the Examiner's interpretation of previously presented claims 12 and 18, the Applicant has further amended claims 12 and 18 to clarify that the thermoelectric layer actively heats or actively cools the fuel cell assembly in contact with the thermoelectric layer. Specifically, claims 12 and 18 recite that the temperature of the fuel cell (or fuel cell stack) is controlled by a voltage of a power source that is adjusted in response to the measured temperature to actively heat or actively cool the fuel assembly (or assemblies) so as to provide a heat distribution of the fuel cell assembly that is substantially uniform. At most, Farkash discloses that a voltage applied to its resistive temperature device can actively heat a collector plate, while reducing a voltage passively cools the collector plate. Such a device does not actively remove heat from a fuel cell assembly.

Applicant reiterates that Paragraphs [0014] and [0017] of the Applicant's specification states that, in order to perform optimally, fuel cells should be maintained at a certain temperature that is nearly uniform across each cell in the stack. For example, at high temperatures, the

catalyst may be destroyed, while at low temperatures, ice may form within the cell assembly. In addition, the catalyst efficiency decreases when the catalyst temperature falls outside an optimal range. Thus, it is important to control the temperature within the fuel cell assembly by either heating or cooling the assembly in order to prevent hot and cold zones that prevent optimal performance of the fuel cell. Therefore, it is important that the thermoelectric layer have the ability to switch back and forth between actively heating and actively cooling the fuel cell assembly during operation of the fuel cell assembly. *See e.g., para. [0063]*. Farkash's resistive temperature device simply allows the fuel cell to drop in temperature by allowing accumulated heat to dissipate when the heating element is turned off. Thus, Farkash's fails to disclose adjusting a voltage of a power source in

Claims 16, 17, 27 and 28 variously depend from claim 12. Because Farkash fails to disclose or suggest the features recited in independent claim 12, dependent claims 16, 17, 27 and 28 are patentable for at least the reasons that claim 12 is patentable.

Regarding independent claim 18, the Office Action admits on Pages 7-8 that Farkash does not expressly teach a step of providing one or more thermoelectric layers in between adjacent fuel cell assemblies in the fuel stack, or a step of measuring the start-up temperature of the fuel cell assembly in contact with a thermoelectric layer. The Office Action turns to Enjoji to overcome the deficiencies of Farkash. However, Enjoji fails to disclose or suggest adjusting a voltage of power source in response to the measured temperature to actively heat or actively cool at least one fuel assembly; or that the heat distribution of a fuel cell is substantially uniform, as claimed. Thus, Enjoji fails to overcome the deficiencies of Farkash, as discussed above. Claims 19, 21, and 24-26 variously depend from claims 18. Because the combination of Farkash and Enjoji fail to disclose or suggest the features recited in independent claim 18, dependent claims 19, 21, and 24-26 are patentable for at least the reasons that claim 18 is patentable.

The Office Action further rejects dependent claim 13 under 35 U.S.C. § 103(a), as allegedly unpatentable over Farkash et al. (US 2001/0036568) in view of Kaneko (JP 06-318736). Claim 13 depends from claim 12. The Office Action admits on Page 4 that Farkash does not expressly teach thermoelectric devices that are Peltier devices. The Office action applies

Kaneko's disclosure of a method of controlling temperature of a substrate by using a Peltier device. However, Applicant notes that Kaneko fails to disclose or suggest measuring the operating temperature of a fuel cell assembly in contact with a thermoelectric layer; adjusting a voltage of power source in response to the measured temperature to actively heat or actively cool the fuel assembly; or that the heat distribution of a fuel cell is substantially uniform, as claimed. Because the combination of Farkash and Kaneko fails to disclose or suggest the features recited in independent claim 12, dependent claim 13 is allowable for at least the reasons that claim 12 is allowable. Additionally, Applicant notes that Farkash teaches use of a coolant to remove heat.

The Office Action further rejects dependent claim 14 under 35 U.S.C. § 103(a), as allegedly unpatentable over Farkash et al. (US 2001/0036568) in view of in view of Keegan (US 2003/0003339). Claim 14 depends from claim 12. The O.A. admits on Page 5 that Farkash does not expressly teach a power source that is a battery. However, Applicant notes that Keegan fails to disclose or suggest measuring the operating temperature of a fuel cell assembly in contact with a thermoelectric layer; adjusting a voltage of power source in response to the measured temperature to actively heat or actively cool the fuel assembly; or that the heat distribution of a fuel cell is substantially uniform, as claimed. Because the combination of Farkash and Keegan fails to disclose or suggest the features recited in independent claim 12, dependent claim 14 is allowable for at least the reasons that claim 12 is allowable.

The Office Action further rejects dependent claim 15 under 35 U.S.C. § 103(a), as allegedly unpatentable over Farkash et al. (US 2001/0036568) in view of in view of in view of Houlberg (US 2004/0137295). Claim 15 depends from claim 12. The O.A. admits on Page 6 that Farkash does not expressly teach a power source that is a fuel cell assembly. However, Applicant notes that Houlberg fails to disclose or suggest measuring the operating temperature of a fuel cell assembly in contact with a thermoelectric layer; adjusting a voltage of power source in response to the measured temperature to actively heat or actively cool the fuel assembly; or that the heat distribution of a fuel cell is substantially uniform, as claimed. Because the combination of Farkash and Houlberg fails to disclose or suggest the features recited in independent claim 12, dependent claim 15 is allowable for at least the reasons that claim 12 is allowable.

The Office Action further rejects dependent claim 20 under 35 U.S.C. § 103(a), as allegedly unpatentable over Farkash et al. (US 2001/0036568) in view of Enjoji et al. (US 2004/0101728) as applied to Claim 18 above, and further in view of Kaneko (JP 06-318736). Claim 20 depends from claim 18. Applicant notes that Enjoji and Kaneko also fails to disclose or suggest adjusting a voltage of power source in response to the measured temperature to actively heat or actively cool the temperature of the at least one fuel assembly; or that the heat distribution of a fuel cell is substantially uniform. Because the combination of Farkash and Enjoji and Kaneko fails to disclose or suggest the features recited in independent claim 18, dependent claim 20 is allowable for at least the reasons that claim 18 is allowable.

The Office Action further rejects dependent claim 22 under 35 U.S.C. § 103(a), as allegedly unpatentable over Farkash et al. (US 2001/0036568) in view of Enjoji et al. (US 2004/0101728) as applied to Claim 18 above, and further in view of Keegan (US 2003/0003339). Claim 22 depends from claim 18. Applicant notes that Enjoji and Keegan also fails to disclose or suggest adjusting a voltage of power source in response to the measured temperature to actively heat or actively cool the temperature of the at least one fuel assembly; or that the heat distribution of a fuel cell is substantially uniform. Because the combination of Farkash and Enjoji and Keegan fails to disclose or suggest the features recited in independent claim 18, dependent claim 22 is allowable for at least the reasons that claim 18 is allowable.

The Office Action further rejects dependent claim 23 under 35 U.S.C. § 103(a), as allegedly unpatentable over Farkash et al. (US 2001/0036568) in view of Enjoji et al. (US 2004/0101728) as applied to Claim 18 above, and further in view of Houlberg (US 2004/0137295). Claim 23 depends from claim 18. Applicant notes that Enjoji and Houlberg also fails to disclose or suggest adjusting a voltage of the power source in response to the measured temperatures to actively heat or actively cool the temperature of the at least one fuel assembly; or that the heat distribution of a fuel cell is substantially uniform. Because the combination of Farkash and Enjoji and Houlberg fails to disclose or suggest the features recited in independent claim 18, dependent claim 23 is allowable for at least the reasons that claim 18 is allowable.

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If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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